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COMMUNICATIONS

AN ENGLISH VIEW OF SCIENCE TEACHING

In an article entitled "Science for All," published in the English magazine *Nature*, it is made evident that prevailing methods of science teaching are being questioned in England as in the United States. In this article the author states that from an examination of science courses and classroom procedure one may conclude that "school science as at present taught, and as defined by examination syllabi, seems to proceed on the assumption that every pupil is to become a skilful experimenter, or an original investigator, in the realms of Nature. Courses of laboratory work designed with this intention may not unfairly be compared with the test-tubing of former times, which aimed at making every boy an analytical chemist." Later in the same article appears the following sentence: "Modern life requires that the elements of scientific method and knowledge should form part of every educational course." Then still later is the sentence: "That is the standard—abiding interest—by which successful teaching may be judged; and we are disposed to think that the descriptive and qualitative school science of a generation or two ago was better adapted to promote such continued attention than is the quantitative work in the narrow fields mapped out for instruction today."

Each of these three quotations might easily serve as the text for one of three common types of discussion of science teaching. There are those who occupy their time in a negative way by showing the inadequacy in modern life of the too prevalent formal methods of science teaching. Then there are those who are trying constructively to introduce the elements of "scientific method and knowledge" into the common activities of those who study science, and the third group is trying to change the content of science courses so that the topics and materials to be used shall appeal to students and develop "abiding interest, by which successful teaching may be judged." It must be clear that these three points of view are harmonious, and the first, when recognized, should not be dwelt upon too long so that the constructive work involved in the second and third may be developed. There are too many science teachers who, spiritually speaking, dwell too constantly upon their "conviction of sin" and give too little attention to their "repentance and reformation."

There is a pretty large number of science teachers throughout the United States who have decided that changes in point of view and in practice are needed and who have set about to develop those changes. Three prominent changes are already evident. One relates to the types of subject-matter used in the old-time courses in science, to the end that the scientific method of thinking may be developed by use of common significant science materials. Another prominent change looks toward the construction of a unified series of high-school science courses, beginning with general topics which find their coherence in the inherent relations of the topics, and which call upon any of the sciences as they may contribute to a study of these topics; then there follow the courses in differentiated sciences, each utilizing and building upon preceding courses. A third conspicuous change may be either cause or corollary of the other two, namely, a markedly different conception by teachers of the real purpose of science teaching and of the necessity of a careful study of general and specific procedure related to science teaching.

It is probably true that science teaching was never better done in high schools than at present, notwithstanding the fact that we see so many lamentably poor practices. But our ideals of what science may do, our newer interpretations of the place of science in the training of the young in a democracy which has about one-half of the secondary pupils of the world and a democracy which uses science in everything it does, impels us to demand reformations which accord with newer ideals. These reformations are now under way and are moving as rapidly as safe experiment seems to justify.

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